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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,877	04/10/2006	Jinying Yan	E0226.0046/P046	2853
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DICKSTEIN SHAPIRO LLP				
1825 EYE STREET NW				
Washington, DC 20006-5403				
EXAMINER				
PHASGE, ARUN S				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
12/07/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/559,877

**Applicant(s)**

YAN ET AL.

**Examiner**

Arun S. Phasge

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/DP)  
Paper No(s)/Mail Date 12/7/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Claim Rejections - 35 USC § 112***

Regarding claims 1, 5, 15, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear how the strongly dissociated anions are separated in the form of electrical migration. Electrical migration is a mechanism and can not be a "form of". Likewise, the further separating steps cannot be a "in the form of" rather a word such as "by".

With regard to "one diluted compartment" and "another diluted compartment" a better way to say it would be "a first diluting compartment" and "a second diluting compartment". This allows for antecedent basis and makes the claim in the present tense, i.e., diluting rather than diluted. Additionally the membrane arrangement to form the compartments is required to define the scope of the claim rather than arbitrary terminology such as "anolyte compartment" (see for example the 4,148,708 patent which calls a compartment anolyte compartment even though no anolyte flows through it).

The following phrases in claim 1 lack antecedent basis; "the same compartment above", "the catholyte compartment" "the anolyte compartment" and "the at least one anolyte compartment".

In claim 2, it is unclear how there can be one anode and two anolyte compartments and one catholyte compartment and two cathodes. Unless the two cathodes are in the same catholyte compartment and the single anode is in two anolyte compartments, which would be physically impossible.

In claim 3, it is unclear how one anion exchange membrane can separate compartments from the anode and one cation exchange membrane can separate the compartments from one of the cathodes

In claim 5, it is unclear how the anions know which anolyte compartment to go to be collected in, because the claims fail to teach how the invention is accomplished.

In claim 6 it is unclear what is meant by the phrase "separated strongly cations".

In claim 7, the following phrases lack antecedent basis; "the initial anolyte", "the pure solution of boric acid", "the initial catholyte" and "the pure solution of a given cation that may be recovered". Further, it is unclear if the cation is the dissociated cation such as Li of claim 1 or another cation.

Claim 9 is unclear because it is unclear because boron is being removed in both the diluted compartments. It maybe that in the first diluting compartment the anions are removed from boron and in the following compartment the boron.

Claim 10 contains the following phrases that lack antecedent basis; "the electrochemical dissociation of boric acid", "the current density of DC current" and "the initial concentration of boron".

Claim 11 contains the following phrases that lack antecedent basis; "the DC current applied to the electrochemical cell", "the electrochemical dissociation of boric acid" and "the regeneration of ion exchange materials".

Claim 12 is unclear because of the phrase "several thousand ppm 50 several tens ppm".

Claim 15 is unclear because of the phrase "a given cation like lithium such as  ${}^7\text{Li}^{+}$ ".

The phrase "the treatment of the aqueous solution" lacks antecedent basis in claim 16.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arun S. Phasge whose telephone number is (571) 272-1345. The examiner can normally be reached on MONDAY-THURSDAY, 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arun S. Phasge/  
Primary Examiner, Art Unit 1795

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